

## Genomic medicine and the future of physiotherapy

Jon Cornwall<sup>1</sup>, Peter Osmotherly<sup>2</sup>

1. Centre for Society, Governance and Science, Faculty of Law, University of Otago, Dunedin, New Zealand
2. School of Health Sciences, University of Newcastle, Newcastle, Australia

---

### EDITORIAL

---

Please cite this paper as: Cornwall J, Osmotherly P. Genomic medicine and the future of physiotherapy. AMJ 2014, 7, 8, 361–362. <http://dx.doi.org/10.4066/AMJ.2014.2218>

---

#### Corresponding Author:

Dr Jon Cornwall

Centre for Society, Governance, and Science, Faculty of Law,  
University of Otago

PO Box 56,

Dunedin, New Zealand

Email: [jon.cornwall@otago.ac.nz](mailto:jon.cornwall@otago.ac.nz)

---

Genomic medicine continues to evolve rapidly, with increasing amounts of information being gathered and shared between researchers at faster rates than ever before. Gene sequencing and the provision of genetic information is becoming increasingly affordable, more prevalent in hospitals and clinics, and visible in the public eye. Indeed, genes for numerous diseases and disorders, including heritable conditions of relevance to physiotherapy practice, are now being discovered with increasing regularity. People can now spend a small amount of money and send a sample of their genetic material away to companies such as 23andMe<sup>1</sup> and PatientsLikeMe<sup>2</sup> to get a report on their genetic profile, including the likelihood of developing some conditions.

The future of medicine, much trumpeted with the sequencing of the human genome, appears to have arrived—personalised approaches to care based upon an understanding of the patient's genetic profile and responses are now a target of many clinical and research streams.<sup>3</sup> Understanding genetic mechanisms involved in aging or disease through interventions such as physical exercise may open entirely new avenues or perspectives on protocols for prevention or management of common chronic conditions<sup>4,5</sup> using modifications produced in various physiological systems and pathologies.<sup>6</sup> The physiotherapy profession, along with many other medical groups, needs to act now to determine how the future of the profession can adapt to the new wave of personalised, genomic medicine.

Specialised clinical members now contribute to professional teams dealing with genomic findings, including geneticists, bioinformaticians, and genetic counsellors. The question appears not so much if physiotherapy will become integrated with genomic medicine, but when and how. A future that is in professional synergy with genomic medicine and specialist teams appears to be a logical extension of our role as rehabilitation professionals. Provision of a framework for the integration of physiotherapy with genomic medicine will provide an opportunity for the profession to advance through translational research and further integrate itself with clinical research groups that currently use genomics. Many funding streams are now demanding that translational medicine is somehow facilitated as a key part of the funding criteria; by integrating physiotherapy with genomic medicine the profession will be able to increase collaborations and take research from the bench to the bedside with increasing effectiveness.

Physiotherapists already play an important role in the prevention and rehabilitation of many common diseases and disorders, including those for which recent strides have been made in our understanding of the contribution of genetic factors to disease occurrence and progression. Recent work has demonstrated the interaction between physical activity and genetic factors related to the chronic inflammatory activity associated with aging<sup>3</sup> and exploration into the genetics of pain and susceptibility to painful pathology is developing.<sup>7</sup> Other conditions for which physiotherapists commonly participate in management include diabetes mellitus and cardiovascular disease. The potential role of physiotherapists in addressing the factors associated with these non-communicable diseases has been recently highlighted,<sup>8</sup> with person-centred health service delivery for such diseases also the subject of a current draft policy statement produced by the World Confederation of Physical Therapy.<sup>9</sup>

An examination of current physiotherapy frameworks to identify how genomics can be integrated into physiotherapy training and practice is required, to determine how the profession will both support and

facilitate the development of good practice for all clinicians and students in relation to their future role in genomic medicine. This will enable the development of a platform for practice that will support physiotherapy involvement in genomic medicine, thereby future proofing physiotherapy for future generations of physiotherapists. If genomic medicine can become integrated successfully in physiotherapy curricula in the near future, it will be well placed to contribute to the development of this exciting field of medicine. In partnership with other medical disciplines, physiotherapy can then redefine itself for the new millennia of medicine—rather than be left behind.

---

## References

1. 23andMe. [Accessed 2014 June 22]. Available from: <https://www.23andme.com/>
2. PatientsLikeMe. [Accessed 2014 June 22]. Available from: <http://www.patientslikeme.com/>
3. Hagberg JM, Jenkins NT, Spangenburg E. Exercise training, genetics and type 2 diabetes-related phenotypes. *Acta Physiol* 2012;205:456–71.
4. Pereira DS, Queiroz BZ, Mateo EC, Assumpção AM, Felício DC, Miranda AS, Anjos DM, Jesus-Moraleida F, Dias RC, Pereira DA, Teixeira AL, Pereira LS. Interaction between cytokine gene polymorphisms and the effect of physical exercise on clinical and inflammatory parameters in older women: study protocol for a randomized controlled trial. *Trials* 2012;13:134.
5. Kaliman P, Parrizas M, Lalanza JF, Camins A, Escoriheula RM, Pallas M. Neurophysiological and epigenetic effects of physical exercise on the aging process. *Ageing Res Rev* 2011;10:475–86.
6. Ntanas-Stathopoulos J, Tzanninis J-G, Philippou A, Koutsilieris M. Epigenetic regulation on gene expression induced by physical exercise. *J Musculoskel Neuronal Interact* 2013; 13:133–46.
7. Mogil JS. Pain genetics: past, present and future. *Trends Genet* 2012;28:258–66.
8. Bury T, Moffat M. Physiotherapists have a vital part to play in combatting the burden of noncommunicable diseases. *Physiother* 2014;94–6.
9. World confederation for Physical Therapy. WCPT policy statement: non-communicable diseases. Draft. London UK: World Confederation for Physical Therapy; 2014.

## PEER REVIEW

Externally peer reviewed.

## CONFLICTS OF INTEREST

JC is the editor of the AMJ.